

60LT1101-9
(GP2-0287)

As could
referred to as "toughened poly(arylene ethers)s" because of the resultant improved compatibility between the poly(arylene ether)s and the other components. Accordingly, other agents that affect the compatibility of the poly(arylene ether) with the various components of the blend (e.g., the thermosetting resin) are toughening agents. Compatibility is meant to include the stabilization of gross phase separation between the components of the blend. Indicators of improved compatibilization include, for example, increased ductility and improved phase morphology stabilization. Improved compatibility of the blend components contributes to the desirable physical properties of the adhesive.

A clean version of the paragraph bridging pages 21 and 22 follows:

As
Poly(arylene ether)-epoxide adhesive compositions were prepared having the compositions as outlined in the Table 2. First, the poly(arylene ether) was dissolved in toluene and tetrabromobisphenol-A diglycidyl ether to produce a solution containing approximately 40% solids. The solution was heated to 90°C to 100°C, followed by addition of bisphenol A and benzoyl peroxide (or, with benzoyl peroxide alone) and maintained at 90°C to 100°C for approximately 90 minutes. The solution was allowed to cool and the styrene-butadiene-styrene (SBS) block co-polymer or polyvinyl butyral compatibilizer was added. The other epoxy resins (bisphenol-A diglycidyl ether/tetrabromo bisphenol-A condensation product and epoxidized novolac) were added and the amount of toluene adjusted to generate a resin solution having 50 weight percent solids. A cure agent package consisting of zinc octoate, 2-methyl-4-ethylimidazole, and diaminodiethylbenzene was then added to complete the formulation.

IN THE CLAIMS

Please cancel Claims 7 and 36 without prejudice.

Please amend Claims 1, 8-10, 17, 21, 25, and 27 as follows in re-written "clean" format:

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1. (Amended/Clean) An adhesive formed from a composition comprising, based on 100 weight percent of the resin portion of the composition:

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about 5 to about 50 weight percent of a poly(arylene ether) resin having a number average molecular weight of about 8,000 to about 13,000;

about 50 to about 90 weight percent of a thermosetting resin selected from the group consisting of cyanate esters, polyesters, epoxy, benzoxazines, benzocyclobutene resins, and mixtures thereof;

about 0.5 to about 15 weight percent of a toughening agent selected from the group consisting of poly(vinyl butyral-co-vinyl acetate) resins, partially hydrolyzed poly(vinyl butyral-co-vinyl acetate) resins, styrene-butadiene-styrene block copolymers, styrene-ethylene-styrene block copolymers, and styrene-ethylene-butylene-styrene block copolymers; and

about 0.1 to about 7 weight percent of a cure agent.

A⁸
8. (Amended/Clean) The adhesive of Claim 1, wherein the thermosetting resin is an epoxy resin comprising the condensation product of a bisphenol polyglycidyl ether and a bromine-substituted bisphenol.

9. (Amended/Clean) The adhesive of Claim 1, wherein the thermosetting resin is an epoxy resin that is the reaction product of tetrabromobisphenol A and the diglycidyl ether of bisphenol A or bisphenol F, the reaction product having an average of at most one aliphatic hydroxy group per molecule, and the reaction product comprising about 10 to about 30 weight percent bromine as aryl substituents.

10. (Amended/Clean) The adhesive of Claim 1, wherein the thermosetting resin comprises at least one halogen-free epoxidized novolac.

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A⁹

17. (Amended/Clean) The adhesive of Claim 16, further comprising a brominated flame retardant selected from the group consisting of bis(2-hydroxyethyl)ether of tetrabromobisphenol A, the bis(3-acryloyloxy-2-hydroxypropyl) ether of tetrabromobisphenol A, the bis(3-methacryloyloxy-2-hydroxypropyl) ether of tetrabromobisphenol A, the bis(3-hydroxypropyl) ether of tetrabromobisphenol A, the bis(2,3-dibromopropyl) ether of tetrabromobisphenol A, the diallyl ether of tetrabromobisphenol A, and the bis(vinylbenzyl) ether of tetrabromobisphenol A, pentabromobenzyl acrylate, dibromostyrenes, tribromostyrenes, tetrabromocyclooctanes, dibromoethyldibromocyclohexanes, ethylene-bis-tetrabromophthalimide, hexabromocyclododecanes, tetrabromophthalic anhydrides, brominated diphenylethers, and tris(2,4,6-tribromophenoxy-1,3,5-triazine).

A¹⁰

21. (Amended/Clean) The adhesive of Claim 1, wherein the toughening agent is styene-butadiene-styrene block copolymer.

A¹¹

25. (Amended/Clean) The adhesive of Claim 1, comprising:

about 20 to about 40 weight percent of the poly(arylene ether) resin;

about 52 to about 80 weight percent of the thermosetting resin;

about 3 to about 10 weight percent of the toughening agent; and

about 0.1 to about 7 weight percent of the cure agent.

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27. (Amended/Clean) An adhesive formed from a composition comprising, based on 100 weight percent of the resin portion of the composition:

A12
about 5 to about 50 weight percent of a poly(arylene ether) resin, wherein the poly(arylene ether) has a number average molecular weight of about 8,000 to about 13,000, and wherein the poly(arylene ether) is the reaction product of a higher molecular weight poly(arylene ether) with a peroxide and, optionally, a phenolic compound;

about 50 to about 90 weight percent of a thermosetting resin resin selected from the group consisting of cyanate esters, polyesters, epoxy, benzoxazines, benzocyclobutene resins, and mixtures thereof;

about 0.5 to about 15 weight percent of a toughening agent selected from the group consisting of poly(vinyl butyral-co-vinyl acetate) resins, partially hydrolyzed poly(vinyl butyral-co-vinyl acetate) resins, styrene-butadiene-styrene block copolymers, styrene-ethylene-styrene block copolymers, and styrene-ethylene-butylene-styrene block copolymers; and

about 0.1 to about 7 weight percent of a cure agent.

Please add new Claim 37:

A13
37. (New) The adhesive of Claim 1, wherein the toughening agent comprises poly(vinyl butyral-co-polyvinyl alcohol-co-polyvinyl acetate).